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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Chong Seng Foo

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INTEL/BSTZ

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EXAMINER

PERUNGAVOOR, SATHYANARAYA V

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

01/27/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/607,074	Applicant(s) FOO ET AL.	
	Examiner SATH V. PERUNGA VOOR	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant(s) Response to Official Action

[1] The response filed on October 27, 2008 has been entered and made of record.

Response to Arguments/Amendments

[2] Presented arguments have been fully considered, but are rendered moot in view of the new ground(s) of rejection necessitated by amendment(s) initiated by the applicant(s).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[3] Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fang et al. ("Fang") [US 2003/0156748 A1].

Regarding claim 1, Fang discloses the following claim limitations:

A method of processing an electronic assembly [*abstract*], comprising: capturing an image of a contact formation on a surface (*i.e. balls*) of a semiconductor package (*i.e. BGA*), wherein the contact formation has a surface comprising a first area (*i.e. foreground*) and a second area (*i.e. background*), where in the first area is a normal brightness area (*i.e. light*) and the second area is a dull brightness area (*i.e. shadow*), the

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image having a width and a plurality of pixels, the pixels having side lengths of at least 20 percent of the width of the image (*i.e. this is met by a rectangular image*) [fig. 1; paras. 0029, 0033 and 0048]; approximating a contact formation shape (*i.e. circle*) and location (*i.e. where the circle is in the image*) based upon the shape of the pattern of selected pixels [fig. 1; para. 0035]; calculating a center of the approximated contact formation shape and location (*i.e. center of circle*), which corresponds to a captured contact point corresponding to an actual contact point on the contact formation [fig. 1; paras. 0033-0035]; and placing the semiconductor package on a circuit board having a socket such that the actual contact point is in a selected position relative to the socket (*i.e. this is an inherent feature of "Pick-and-Place" machines*) [para. 0029].

Fang does not explicitly disclose the following claim limitations:

selecting pixels from the plurality of pixels, wherein the selected pixels have a minimum threshold of normal brightness area

However, Fang does disclose the desirability of using normal illumination images [para. 0048];

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Fang and filter out poor illumination images, the motivation being that poor illumination images have reduced contrast, which makes processing difficult [para. 0048].

Regarding claim 2, Fang meets the claim limitations, as follows:

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The method of claim 1, further comprising picking the semiconductor package (*i.e.* BGA) from a support (*i.e.* Pick and Place machines inherently have this feature by picking from a reel and tray) [para. 0029].

Regarding claim 3, Fang meets the claim limitations, as follows:

The method of claim 2, further comprising suspending the surface of the semiconductor package within a field of view of the camera (*i.e.* Pick and Place machines inherently have this feature) [para. 0029].

Regarding claim 4, Fang meets the claim limitations, as follows:

The method of claim 3, wherein the image is captured with a CCD camera (*i.e.* a camera is inherently present and CCD camera is well-known and the Examiner takes Official Notice) [para. 0035].

Regarding claim 5, Fang meets the claim limitations, as follows:

The method of claim 1, wherein the approximating of the contact formation shape and location and the calculating of the center of the contact formation center comprises the use of a computer [para. 0049].

Regarding claim 6, Fang meets the claim limitations, as follows:

The method of claim 5, wherein the contact formation shape approximates a circle [para. 0033].

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Regarding claim 7, Fang meets the claim limitations, as follows:

The method of claim 1, wherein the captured image includes only the normal brightness area of the outer surface of the contact formation [para. 0048].

Regarding claim 8, Fang meets the claim limitations, as follows:

The method of claim 7, wherein the contact formation has an outer edge (*i.e. circle*) and an actual center (*i.e. center of circle*) [para. 0035].

Regarding claim 9, Fang meets the claim limitations, as follows:

The method of claim 8, further comprising defining an outer edge of the captured image (*i.e. circle*) and determining a captured image center (*i.e. center of circle*) [para. 0035].

Regarding claim 10, Fang meets the claim limitations, as follows:

The method of claim 5, wherein the approximating of the contact formation shape and location further comprises using data provided to the computer of an expected size and shape of the contact formation (*i.e. BGA Model*) [para. 0029].

Regarding claim 11, Fang meets the claim limitations, as follows:

The method of claim 6 wherein the contact formation is substantially spherical (*i.e. balls of a BGA*) [fig. 3a; para. 0029].

Regarding claim 12, Fang meets the claim limitations, as follows:

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The method of claim 11, wherein there are a plurality of contact formations (*i.e. balls*) on the surface of the semiconductor package (*i.e. BGA*) [fig. 3a].

Regarding claim 13, Fang meets the claim limitations, as follows:

The method of claim 12, wherein the contact formations are BGA solder balls [fig. 3a].

Regarding claim 14, Fang meets the claim limitations, as follows:

The method of claim 13, wherein the contact formation has a diameter of approximately 0.55 mm [fig. 3a].

Regarding claim 15, Fang meets the claim limitations, as follows:

The method of claim 1 wherein the semiconductor package is a microprocessor [fig. 3a].

Regarding claim 16, Fang meets the claim limitations, as follows:

The method of claim 15, wherein the circuit board is a motherboard (*i.e. it is notoriously well known to place BGA in a motherboard, Examiner takes Official Notice*) [para. 0029].

Regarding claim 17, Fang meets the claim limitations, as follows:

The method of claim 1 wherein the socket has a plurality of conductor pads formed therein and when the semiconductor package is placed within the socket, the actual

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contact point of each contact formation contacts a conductor pad in the socket (*i.e. it is notoriously well known to place a BGA in contact pads so as to make it operational with other elements in the circuit board. Examiner takes Official Notice*) [para. 0029].

Regarding claims 18-28, all claimed limitations are set forth and rejected as per discussion for claims 1-17.

Contact Information

[4] Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Sath V. Perungavoor whose telephone number is (571) 272-7455. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Matthew C. Bella whose telephone number is (571) 272-7778, can be reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Dated: January 26, 2009

/Matthew C Bella/
Supervisory Patent Examiner,
Art Unit 2624

Sath V. Perungavoor
Telephone: (571) 272-7455

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Conclusion

[] Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

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Dated: January 26, 2009

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